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The Files - Contract 600, T.O. 1

14 April 1959

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[REDACTED]

Trip Report - Traveling Wave Tube Amplifier

1. On 25 March 1959 the undersigned visited the [REDACTED] Laboratories, Sunnyvale, California, to monitor progress under Contract 600, Task Order 1, providing for the development and fabrication of the HA-36, HA-45, HA-47, HA-48 and HA-49 traveling wave tubes. The present state of development on these tubes was discussed with [REDACTED] Laboratories.

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2. The HA-45 will be a low noise solenoid-focused tube operating in the 0.5 to 1 kilomegacycle range. Gain shall be greater than 25 db and the noise figure shall be less than 10 db. The first engineering model of this tube has been produced, and tests indicate that the noise figure will be as low as 6 to 7 db. The first model of this tube should be ready for delivery within 2 weeks.

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3. The HA-36, a permanent-magnet-focused tube operating in the 0.5 to 1 kilomegacycle range, is specified as having a gain greater than 30 db and a noise figure less than 25 db. The first engineering model of this tube has also been completed and deliveries should commence within 2 to 3 weeks.

4. The HA-47 is a low noise tube operating in the 4 to 8 kmc range. Its gain shall be greater than 25 db and the noise figure less than 10 db. This tube will be of immediate value to the [REDACTED] antenna installation, where it will be used to replace the Band 6 antenna pre-amp TWT, which has a noise figure of approximately 17 db over most of the band, and more at the edges of the band. The goal of 10 db noise figure has not yet been reached, but the rate of progress on the tube indicates that an acceptable engineering model should be ready for delivery within 1 or 2 months.

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5. The HA-48 and HA-49 TWT's are designed to operate in the 12 to 16 kmc range. The HA-48 is solenoid-focused, will have a gain greater than 25 db, and a noise figure less than 13 db. The HA-49 will be permanent-magnet-focused, will have a gain greater than 30 db and a noise figure less than 30 db. Development of these tubes has not progressed as rapidly as development of the other tube types due to the greater difficulties encountered in fabrication of TWT design for higher frequencies. It appears reasonable to expect, however, that the first models of these tubes should be ready for delivery within the next 6 weeks. The expiration date of this contract is 14 May 1959. It is apparent that a time extension will be required in order to complete the work provided for under the task.

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6. It was decided by mutual agreement between the technical representative and [REDACTED] that brief monthly letter progress reports would be of real advantage to both the contractor and the Government. Accordingly, [REDACTED] will submit a brief letter report summarizing the areas of research progress and the principal difficulties remaining in the development and fabrication of the five tube types.

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